

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of	)	
	)	
Expanding Flexible Use in Mid-Band Spectrum	)	GN Docket No. 17-183
Between 3.7 and 24 GHz	)	
	)	

**COMMENTS OF WI-FI ALLIANCE**

Edgar Figueroa  
President and CEO

Wi-Fi ALLIANCE  
10900-B Stonelake Blvd.  
Suite 126  
Austin, TX 78759  
(512) 498-9434  
[efigueroa@wi-fi.org](mailto:efigueroa@wi-fi.org)

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Wi-Fi Alliance submits these comments in response to the Notice of Inquiry (“NOI”) in the above-referenced proceeding in which the Commission seeks input on potential opportunities for additional flexible access, particularly for wireless broadband services, in spectrum bands between 3.7 and 24 GHz.<sup>1/</sup> Wi-Fi Alliance applauds the Commission for initiating this important proceeding, which can begin the process of making mid-band spectrum – particularly the 5.925-7.125 GHz band (the “6 GHz band”) – available for unlicensed devices, and looks forward to the Commission’s adoption of a Notice of Proposed Rulemaking (“NPRM”) as the next step in that process.

**I. BACKGROUND AND SUMMARY**

Wi-Fi Alliance®<sup>2/</sup> is a global, non-profit industry association of 800 leading companies from dozens of countries devoted to seamless interoperability. With technology development, market

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<sup>1/</sup> *In the Matter of Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Inquiry, GN Docket No. 17-183 (rel. Aug. 3, 2017). The Commission references the spectrum bands between 3.7 GHz and 24 GHz as “mid-band” spectrum.

<sup>2/</sup> Wi-Fi®, the Wi-Fi logo, the Wi-Fi CERTIFIED logo, Wi-Fi Protected Access® (WPA), WiGig®, the Wi-Fi Protected Setup logo, Wi-Fi Direct®, Wi-Fi Alliance®, WMM®, Miracast®, and Wi-Fi CERTIFIED Passpoint® , and Passpoint® are registered trademarks of Wi-Fi Alliance. Wi-Fi CERTIFIED™, Wi-Fi Protected Setup™, Wi-Fi Multimedia™, WPA2™, Wi-Fi CERTIFIED Miracast™, Wi-Fi ZONE™, the Wi-Fi ZONE logo, Wi-Fi Aware™, Wi-Fi CERTIFIED HaLow™, Wi-Fi HaLow™, Wi-Fi CERTIFIED WiGig™, Wi-Fi CERTIFIED Vantage™, Wi-Fi Vantage™, Wi-Fi CERTIFIED TimeSync™, Wi-Fi TimeSync™, Wi-Fi CERTIFIED Location™, Wi-Fi CERTIFIED Home Design™, Wi-

building, and regulatory programs, Wi-Fi Alliance has enabled widespread adoption of Wi-Fi® worldwide by certifying thousands of Wi-Fi products each year. It is also an active participant before the FCC<sup>3/</sup> and in international proceedings,<sup>4/</sup> promoting regulatory actions that facilitate Wi-Fi connectivity while maximizing unlicensed spectrum use in general.

Mid-band spectrum is needed to accommodate the ever-increasing demands for broadband wireless connectivity, demands that stem from the success and universal adoption of Wi-Fi technology. The pressure on the existing spectrum that supports Wi-Fi has grown, but despite the wide recognition of this need, there has been disproportionately little associated action to create additional spectrum capacity. The time to act is now. The 6 GHz band identified by the Commission is ideal to help meet these spectrum requirements. The Commission should therefore immediately issue an NPRM proposing rules that open the 5.925-7.125 GHz band for unlicensed operations while recognizing the operation of incumbent services. Doing so will help relieve the stress on existing Wi-Fi spectrum, maintain U.S. leadership in fostering the advances in wireless

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Fi CERTIFIED Agile Multiband™, Wi-Fi CERTIFIED Optimized Connectivity™, and the Wi-Fi Alliance logo are trademarks of Wi-Fi Alliance.

<sup>3/</sup> See, e.g., *Comments of Wi-Fi Alliance*, GN Docket 16-142 (filed May 9, 2017) (ATSC 3.0 Proceeding); *Comments of Wi-Fi Alliance*, OET 16-415 (filed Feb. 27, 2017) (Amtrak Waiver Request); and *Comments of Wi-Fi Alliance*, GN Docket 14-177 *et al.* (filed Jan. 31, 2017, Oct. 31, 2016, and Sept. 30, 2016) (Spectrum Frontiers).

<sup>4/</sup> See, e.g., *Comments of Wi-Fi Alliance in response to Infocomm Media Development Authority of Singapore, 5G Mobile Services and Networks*, (filed Jul. 27, 2017), available at <https://www.imda.gov.sg/~media/imda/files/inner/pcdg/consultations/consultation%20paper/public%20consultation%20on%205g%20mobile%20services%20and%20networks/5g%20mobile%20services%20and%20networks-wi-fi%20alliance.pdf?la=en>; *Response of Wi-Fi Alliance to Australian Communications and Media Authority, Five-Year Spectrum Outlook: 2016-20, The ACMA's spectrum management work program*, (filed Jan. 20, 2017), available at <http://www.acma.gov.au/~media/Spectrum%20Licensing%20Policy/Issue%20for%20comment/IFC%2023%202016/WIFI%20Alliance%20submission.docx>; and *Comments of Wi-Fi Alliance in response to Telecom Regulatory Authority of India, Consultation Paper on Proliferation of Broadband through Public Wi-Fi Networks*, (filed Aug. 24, 2016), available at [http://trafai.gov.in/sites/default/files/201608260616254662529Wi-Fi\\_Alliance.pdf](http://trafai.gov.in/sites/default/files/201608260616254662529Wi-Fi_Alliance.pdf).

broadband technologies which lead to global harmonization and, as a result, benefit American consumers and businesses.

## **II. THERE IS EXPLOSIVE GROWTH IN WI-FI DATA TRAFFIC AND MORE SPECTRUM IS NEEDED TO MEET THAT DEMAND**

Wi-Fi Alliance concurs with the Commission's assessment that projected demand for broadband wireless connectivity, including Wi-Fi, necessitates exploring new, more flexible spectrum policy approaches.<sup>5/</sup> Wi-Fi continues to be a critical component of U.S. wireless broadband infrastructure: it is the predominant on- and off-ramp for Internet access from U.S. homes and businesses;<sup>6/</sup> it supports a significant portion of wireless carrier's network traffic through offload;<sup>7/</sup> and it is, and will be, an important part of the Internet of Things ("IoT") architecture.<sup>8/</sup> Ensuring that there is sufficient spectrum for Wi-Fi – and in a timely manner to meet dramatically expanding demand – is in the public interest.

The evolution of Wi-Fi from a nascent technology to a critical component of broadband wireless connectivity infrastructure, however, has not been met by a corresponding increase in

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<sup>5/</sup> See, *NOI* at ¶¶ 5-6.

<sup>6/</sup> CISCO, *VNI Complete Forecast Highlights Tool, North America, United States, Wired Wi-Fi and Mobile Growth* (2017), [http://www.cisco.com/c/m/en\\_us/solutions/service-provider/vni-forecast-highlights.html](http://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html) (select "United States" from the "North America" drop-down menu, select "2021 Forecast Highlights" and expand "Wired Wi-Fi and Mobile Growth."). CISCO expects Wi-Fi traffic to account for almost half of all Internet traffic by 2020. CISCO, *Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016–2021* at 21, Feb. 7, 2017, available at <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.pdf>.

<sup>7/</sup> See, e.g. *Comments of CTIA-The Wireless Association*, ET Docket 15-105 (filed June 11, 2015) (noting that "Wi-Fi technologies have been and will continue to be an integral part of consumers' wireless usage"); and *Comments of T-Mobile USA, Inc.*, ET Docket 15-105 (filed June 11, 2015) (noting that "Wi-Fi is a critical component of its network" and that Wi-Fi calling and texting is a function on many of its devices).

<sup>8/</sup> Most IoT connections already travel over Wi-Fi networks. Wi-Fi Alliance is developing a standard for IoT operations in sub-1 GHz spectrum which will allow for low-power, long-distance operations for machine-to-machine connections. See, *Wi-Fi Alliance, Discover Wi-Fi HaLow*, available at <http://www.wi-fi.org/discover-wi-fi/wi-fi-halow>.

spectrum access, despite the widely recognized need to provide more spectrum to satisfy Wi-Fi and unlicensed technologies.<sup>9/</sup> The situation has been made worse by the lack of available spectrum in the 5 GHz band. Recent NTIA action foreclosing unlicensed operations in the 5.35-5.47 GHz (U-NII-2B) band significantly disrupted Wi-Fi industry plans to accommodate growing demand in the mid-band spectrum.<sup>10/</sup> Although Wi-Fi Alliance has urged, and continues to urge, the Commission to make the U-NII-4 band available for unlicensed operations, its future remains uncertain.<sup>11/</sup> It has been nearly 20 years since a significant amount of mid-band spectrum has been made available for unlicensed operations – during which time the number of devices and applications relying on this spectrum has grown exponentially.

The problem of highly limited and restricted Wi-Fi access in the 5 GHz frequency range is exacerbated by the limitations of other spectrum that is generally available for unlicensed use. The 2.4 GHz (2400-2483 MHz) band, for example, has historically supported a significant percentage of Wi-Fi traffic and a multitude of other unlicensed applications, and, as a result, is highly

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<sup>9/</sup> The need for additional unlicensed spectrum has been recognized for years, notably in the *Middle Class Tax Relief Act of 2012*, Pub. Law 112-96 §§ 6406 and 6407 (requiring unlicensed operations in the 5 GHz Band and guard bands). *See also*, Commissioner O’Rielly and Rosenworcel, *Driving Wi-Fi Ahead: the Upper 5 GHz Band*, FCC Blog Post (rel. Feb. 23, 2015) (noting that “Wi-Fi spectrum bands are wildly popular...[despite FCC efforts] to secure some unlicensed spectrum opportunities...more needs to be done – and soon.”); *Statement of Commissioner Ajit Pai, In Re Amendment of Part 15 of the Commission’s Rules for Unlicensed Operations in the Television Bands* FCC 15-99 (Aug. 11, 2015) (“I am a big proponent of making more spectrum available for unlicensed use”); *In Re Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, Statement of Commissioner Mignon Clyburn*, FCC 13-22 (Feb. 20, 2013) (“unlicensed spectrum is now being heavily used to off load data traffic. The economists who have studied the area have different estimates, but there is a consensus that Wi-Fi off load saves wireless companies tens of billions of dollars in network costs each year. Demand for unlicensed services, has spiked so much that the 2.4 GHz band is now congested particularly in major cities. We have to be ambitious in finding more ways to provide...unlicensed spectrum for commercial services.”)

<sup>10/</sup> *See, NOI at ¶ 28*

<sup>11/</sup> The Commission’s testing for U-NII-4 Devices to determine compatibility with Dedicated Short Range Communications systems on automobiles is ongoing. *See, Office of Engineering and Technology Announces Schedule for Testing Prototype U-NII-4 Devices*, Public Notice (rel. Oct. 7, 2016).

congested.<sup>12/</sup> In addition to congestion-related issues, it will not be able to remain the backbone of Wi-Fi in the future – Wi-Fi Fifth Generation (“5G”) technologies require wider channels, which cannot be accommodated in the 2.4 GHz band. The next generation Wi-Fi standard, IEEE 802.11ax, is optimized for channel bandwidths of 80 megahertz and 160 megahertz,<sup>13/</sup> far larger than the 20 megahertz channels used in the 2.4 GHz band.

Similarly, to the extent that unlicensed spectrum is made available in the 600 MHz band, it will be limited because of its inability to support higher data rate applications. And while Wi-Fi Alliance applauds the Commission for making spectrum in the millimeter wave bands (*i.e.*, at 64-71 GHz, in addition to the already allocated 57-64 GHz) available for unlicensed access, that spectrum lacks propagation characteristics of mid-band spectrum which are necessary to accommodate wider-area deployments.<sup>14/</sup>

Although Wi-Fi is *the* most universally accepted unlicensed application, the lack of spectrum access threatens its ability to continue to deliver significant socioeconomic benefits and foster innovation. Wi-Fi Alliance recently commissioned a Spectrum Needs Study that highlights the requirements for additional unlicensed spectrum.<sup>15/</sup> Given projected Wi-Fi traffic growth by 2025, up to 1500 megahertz of additional mid-band spectrum may be needed<sup>16/</sup> The Spectrum

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<sup>12/</sup> Wi-Fi Alliance, *Spectrum Needs Study* at p. 23, Feb. 2017, available at <https://www.wi-fi.org/downloads-registered-guest/Wi-Fi%2BSpectrum%2BNeeds%2BStudy0.pdf/33364> (“Spectrum Needs Study”).

<sup>13/</sup> See, National Instruments, *Introduction to 802.11ax High-Efficiency Wireless*, White Paper, Jul. 24, 2017, available at <http://www.ni.com/white-paper/53150/en/>.

<sup>14/</sup> See, *In the Matter of Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, GN Docket 14-177 at ¶180 (rel. Jul 14, 2016); and IEEE, *Millimeter-Wave Cellular Wireless Networks: Potentials and Challenges*, Feb. 5, 2014, available at <http://ieeexplore.ieee.org/document/6732923/?reload=true> (noting that mmWave networks are unable to penetrate many building walls and therefore may require many deployments to cover large areas).

<sup>15/</sup> See, *Spectrum Needs Study*.

<sup>16/</sup> *Id.* at 1. The Spectrum Needs Study also evaluated different spectrum requirement scenarios, depending in part on whether current spectrum with dynamic frequency selection (“DFS”) limitations can be

Needs Study also demonstrates the need for contiguous spectrum blocks to accommodate 160 megahertz channels which are desirable for high-bandwidth applications, such as video and virtual reality, supported by the next generation Wi-Fi (IEEE 802.11ax) technologies that are specifically intended to support high-data throughput connectivity.<sup>17/</sup> In short, rapidly growing demand for broadband wireless connectivity delivered by Wi-Fi to American consumers and enterprises is outpacing available spectrum capacity. Only urgent regulatory action can prevent this looming spectrum crunch from degrading the socioeconomic benefits delivered by Wi-Fi. Wi-Fi Alliance urges the Commission to move forward on making the much needed spectrum available for Wi-Fi access.

### **III. THE 5.925-7.125 GHz BAND SHOULD BE MADE AVAILABLE FOR UNLICENSED OPERATIONS**

Although the Commission asks separately about the potential use of the bands 5.925-6.425 GHz and 6.425-7.125 GHz, both are required to meet expanding needs for unlicensed operations. These two sub-bands share the features noted below that make the 6 GHz band particularly attractive for Wi-Fi (recognizing that some segments of the band may require their own special rules). And technology development is proceeding across the entire 6 GHz band, not within sub-bands separately. For example, IEEE already initiated efforts to extend the 802.11ax standard to the entire 5.925-7.125 GHz band.<sup>18/</sup> In addition, there are incumbent operations throughout both sub-bands,<sup>19/</sup> meaning that Wi-Fi will be required to avoid frequencies used by existing licensees for

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made more accessible. The Spectrum Needs Study found that if there is greater use of DFS-limited spectrum, spectrum needs for Wi-Fi may be reduced to 600 megahertz. *Id.* at 25.

<sup>17/</sup> *Id.* at 18.

<sup>18/</sup> See, IEEE, *P802.11ax PAR Modification*, Abstract, Jul. 12, 2017, available at <https://mentor.ieee.org/802.11/dcn/17/11-17-0913-02-00ax-par-modification-to-support-6-ghz-band.docx>.

<sup>19/</sup> See, *NOI* at ¶¶ 24 and 32.



two reasons – to protect incumbent operations and to ensure that Wi-Fi operations are not subject to interference, particularly from high power point-to-point microwave and earth stations. Both goals will be easier to achieve by spreading Wi-Fi access across the entire 1.2 gigahertz of spectrum.

As the Commission notes, the 6 GHz band offers a unique opportunity for U-NII expansion.<sup>20/</sup> Perhaps most importantly, the 5.925-7.125 GHz band is adjacent to current unlicensed U-NII bands; this means that existing technologies designed for the 5 GHz band can be rapidly adapted and deployed in the 5.925-7.125 GHz band. The extensive market that exists today for 5 GHz technology<sup>21/</sup> also offers significant economies of scale and other benefits for Wi-Fi devices with access to the 6 GHz band. Permitting unlicensed use of the 5.925-7.125 GHz band will enable various industry sectors that already use 5 GHz systems – consumers, carriers, enterprise users – to more easily expand current operations. Similarly, existing regulations provide a regulatory precedent to assess how access to the 6 GHz band can be permitted for unlicensed use.

As the Commission observes, there are existing operations in the 6 GHz band.<sup>22/</sup> To the extent current operations remain in the 6 GHz band, unlicensed Wi-Fi devices would not preempt or degrade regulatory spectrum access rights of those systems. Wi-Fi has a long history of operating in frequency bands with other users – both licensed and unlicensed – and can replicate that success in the 6 GHz band. Regulatory solutions that have been mandated and implemented in the 5 GHz U-NII bands, including transmit power limits, antenna gain masks, and other operational constraints<sup>23/</sup> can be adopted for Wi-Fi operations in the 5.925-7.125 GHz band. These regulatory

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<sup>20/</sup> See, *NOI* at ¶¶ 27, 28, and 36.

<sup>21/</sup> See, Wi-Fi Alliance, *Preserving unlicensed spectrum access for Wi-Fi in 5 GHz*, May 30, 2017, available at <https://www.wi-fi.org/beacon/alex-roytblat/preserving-unlicensed-spectrum-access-for-wi-fi-in-5-ghz> (noting that “almost all” Wi-Fi devices now support 802.11ac, which operates in the 5 GHz band).

<sup>22/</sup> See, *NOI* at ¶¶ 24 and 32.

<sup>23/</sup> See, 47 CFR 15.401-407.

solutions can be further augmented, if necessary, to provide additional protection to incumbent operations in the band. As an unlicensed technology, Wi-Fi is obligated to protect and will not constrain incumbent services in a way that additional in-band licensed services cannot. Indeed, unlicensed operations – ultra wideband and ground-level radars permitted under Part 15 of the Commission’s rules – already successfully co-exist with licensed operations in the 5.925-7.125 GHz frequency band. Wi-Fi Alliance is developing and plans to provide a comprehensive set of regulatory solutions in the course of this proceeding for further consideration.

Some of the incumbent licensees in the 6 GHz band are authorized in the fixed service (“FS”) and the use of those systems is reflected in the Commission’s Universal Licensing System (“ULS”) database. Any new unlicensed operations in the 6 GHz band will be required to account for and protect this incumbent use. Accordingly, as part of this proceeding, and in order to permit the most meaningful use of the 6 GHz band by other services, the Commission should ensure that the ULS database is up to date, accurate and reflects only currently active licenses.<sup>24/</sup> This will allow the Commission, and prospective users and manufacturers of unlicensed devices designed for the 5.925-7.125 GHz band, to make the most effective use of that band by not requiring protection of non-existent operations while ensuring that current and future users are taken into account by unlicensed operators. Based on a preliminary assessment, it appears that some licensed FS stations are no longer in operation. The Commission should, therefore, issue a Public Notice requiring microwave licensees to affirm current operations or modify licenses to reflect existing use.<sup>25/</sup> Wi-Fi

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<sup>24/</sup> Others have also noted the need for more up to date and accurate information in the Commission’s ULS databases, recently in filings relating to the application by Higher Ground, LLC for a 6 GHz network. *See, e.g., Notice of Ex Parte Presentation, IBFS File No. SES-LIC-20150616-00357, Call Sign E150095, Utilities Technology Council*, at 2 (filed June 9, 2017); *Response of Tri-State Generation and Transmission Association to Higher Ground Technical Appendix*, at 4, (filed Mar. 20, 2017).

<sup>25/</sup> Licensees that are not currently operational under the Commission’s rules (either because they have not yet been required to satisfy a build out obligation or have permissibly discontinued service) would still be able to affirm that their licenses remain active.

Alliance suggests that ULS should be updated based on the responses received and an absence of a response be noted in ULS indicating that the operation of the non-responsive licensee need not be taken in to account by unlicensed services.

#### **IV. ADDITIONAL BANDS**

Of all the bands the Commission is reviewing (3.7 GHz to 24 GHz), the 5.925-7.125 GHz band is best suited for Wi-Fi operations, for the reasons stated above. However, as the Commission continues to review bands that may be available for commercial operations, it must conduct that assessment keeping in mind the need for Wi-Fi and other unlicensed capacity, making sure there is a pipeline of additional spectrum to support future applications and growth. Use of licensed and unlicensed spectrum is complementary; whenever additional spectrum is made available in a new band, some should be designated for both licensed and unlicensed operations. Future wireless allocations should support both licensed and unlicensed spectrum in general and Wi-Fi operations in particular.

#### **V. DFS USE OF 5 GHz SPECTRUM**

Wi-Fi Alliance appreciates the Commission's efforts to better understand the use of unlicensed spectrum which is subject to DFS requirements.<sup>26/</sup> Wi-Fi Alliance has been working with its membership to improve the understanding of the use of bands subject to these requirements. DFS is a well-proven mechanism for the protection of radar operations. Nevertheless, greater use of the DFS-constrained frequency bands will not alleviate the need for additional unlicensed spectrum capacity. The following are among the issues contributing to lighter use of the bands in which DFS requirements are imposed: (1) as noted below, DFS limits the use of some applications; (2) additional time is needed to obtain equipment approval for products using DFS frequencies; and (3)

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<sup>26/</sup> See, *NOI* at ¶ 30.

there is added complexity in designing and producing equipment with DFS capabilities. In addition, once successfully engineered into devices, DFS creates an ongoing operational cost for the device or system due to regulatory obligations for channel availability check time, in-service monitoring, and non-occupancy period, among other requirements. These requirements make a system operating on DFS-limited channels less available than one that uses only unencumbered channels, particularly if the system detects false radar patterns.

Wi-Fi products have successfully operated in the DFS band for more than ten years. DFS is a useful tool that demonstrates how Wi-Fi can co-exist with radar systems, proving itself over years of successful operations. The Wi-Fi industry has a strong track record of compliance with DFS, and understands the importance of protecting radar operations. While Wi-Fi Alliance is aware of instances of action taken by the Commission's Enforcement Bureau involving DFS, those recent cases have been limited to other technologies (not 802.11-based technologies).<sup>27/</sup> To Wi-Fi Alliance's knowledge, there have been no cases where interference occurred when DFS was properly implemented using 802.11-based technologies.

As the Commission notes, the heaviest use of the 5 GHz band is in those segments without DFS requirements.<sup>28/</sup> Wi-Fi Alliance recently conducted a survey regarding industry experience with DFS, which highlights challenges for Wi-Fi implementations in spectrum with DFS requirements. That survey found that, when members did not include DFS channels in products, it

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<sup>27/</sup> See, e.g., *In the Matter of Towerstream Corporation, Middletown, Rhode Island*, Order, 28 FCC Rcd. 11604 (2016); *Letter from the Miami Office of the Federal Communications Commission Enforcement Bureau to Wide Cloud Communications of Hialeah, FL*, Notification of Harmful Interference, Case No. EB-FIELDSCR-16-00021831 (Jul. 13, 2016); *Letter from the Miami Office of the Federal Communications Commission Enforcement Bureau to Aptech Networks Corp. of Doral, FL*, Notification of Harmful Interference, Case No. EB-FIELDSCR-16-00021849 (June 13, 2016); *In the Matter of Directlink, LLC, Parker, Colorado*, Memorandum Opinion and Order, 30 FCC Rcd. 2222 (2015).

<sup>28/</sup> See, *NOI* at ¶ 30.

was because of technical complexity, reduced performance, increased regulatory costs and timing sensitivities (principally, equipment approval delays). However, even removing some of these obstacles will not produce universal use of the DFS bands. Not all applications can be supported in the DFS bands: peer-to-peer and tethering applications are not possible because of technical, cost, and time-to-market reasons. These impediments and the operational costs associated with DFS today – even for those applications where it can be used – are further reasons why designation of the 6 GHz band for Wi-Fi is critical now.

Nevertheless, as the Wi-Fi industry has gained extensive experience with DFS implementation, many products have been introduced that operate on the DFS channels. And, to the extent some of the issues identified can be addressed, there will be increased use of DFS to enable access to more channels. Indeed, many respondents to Wi-Fi Alliance’s survey stated that they are likely to enable DFS channels for a range of applications in the future. And a significant percentage of respondents indicated willingness to pay additional fees to speed the time to complete DFS testing as part of device approval.

Therefore, Wi-Fi Alliance fully supports the Commission’s approach, which does not contemplate changes to the DFS rules at this time.<sup>29/</sup> Industry and the Commission should continue to collaborate on how to address the issues that limit use of the DFS bands, understanding that reducing some of the impediments will not eliminate the need for additional spectrum capacity nor make the DFS bands appropriate for all applications.

## **VI. CONCLUSION**

Unlicensed devices, such as those certified under one of the many Wi-Fi Alliance protocols, play a crucial role in providing Americans, and their devices, with broadband wireless connectivity.

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<sup>29/</sup> See, *NOI at ¶ 30*.

However, more and more traffic is now being sent over those networks, and new and exciting technologies are being developed that will further congest spectrum that supports Wi-Fi. That is why additional spectrum capacity is needed now and in the future, especially in the mid-band spectrum as identified in the NOI. The 5.925-7.125 GHz band is ideally suited to unlicensed operations because of its propagation characteristics and its proximity to unlicensed spectrum in the 5 GHz band. Existing Part 15 rules and regulatory solutions, which have been successful in fostering efficient spectrum utilization while protecting incumbents, can be adapted and applied to this band if required to accommodate incumbent operations. Wi-Fi Alliance urges the Commission to act immediately to provide more capacity for Wi-Fi systems so that consumers and businesses can continue to use this critical link in the wireless ecosystem.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Edgar Figueroa', with a long horizontal flourish extending to the right.

Edgar Figueroa  
President and CEO

WI-FI ALLIANCE  
10900-B Stonelake Blvd.  
Suite 126  
Austin, TX 78759  
(512) 498-9434  
[efigueroa@wi-fi.org](mailto:efigueroa@wi-fi.org)

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